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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/739,750	12/20/2000	Hiroshi Takanashi	2000_1749	4981

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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 12/07/2001

4

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-4

Office Action Summary

Application No.

09/739,750

Applicant(s)

TAKANASHI ET AL.

Examiner

Sin J Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/262,077.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> | 6) <input type="checkbox"/> Other: |

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. It is to be noted that the Examiner interpreted present limitation "(E) . . . in an amount of 3.5 wt% or less" to mean that the presence of the (E) component is *not* required since the present claim language of "3.5 wt% or less" is an *open-ended* language (i.e., the range does not specify minimally required amount). Besides, in Example 1 (see Table 1), applicant actually shows an embodiment in which 0 parts by weight of p-toluenesulfonamide is added.

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4. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Cohen et al (4,551,415).

In Example 1, Cohen teaches (see Table 1 in col.14) a photosensitive coating composition containing (I) polymethylmethacrylate (*present component (A)*), (ii) trimethylolpropane triacrylate and tetraethylene glycol diacrylate (*present component (B)*), (iii) Michler's ketone, benzophenone, and bis(2-o-chlorophenyl-4,5-bis-phenyl)imidazole (*present component (C)*), and 2.22 wt % of mixture of ortho and para-toluene sulfonamide (*present component (E)* since present component (E) is *at least one member* of ortho or para-toluene sulfonamide). Cohen also teaches (col.9, lines 3-13) that 0.001-2.0wt% of thermal polymerization inhibitors (*present component (D)*) may be present in his photopolymerizable composition. Therefore, one of ordinary skill in the art would immediately envisage adding 0.001-2.0wt% of thermal polymerization inhibitor into the photosensitive coating composition in Cohen's Example 1. Therefore, Cohen teaches present inventions of claims 1 and 4.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al (4,551,415).

Cohen with respect to present claim 1 is discussed above in Paragraph 4. With respect to present claim 5, although Cohen's Example 1 uses polymethyl methacrylate as their polymeric binder, Cohen also teaches (col.5, lines 32-35, lines 66-68, col.6, lines 1-3) equivalence of this binder to other water soluble binders such as cellulose acetate, methyl cellulose, ethyl cellulose and polyvinyl acetal. Since polymethyl methacrylate and these water soluble binders were art-

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recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to replace polymethyl methacrylate with one of those water soluble binders as the polymeric binder in Cohen's Example 1. Therefore, Cohen's teaching would render obvious present invention of claim 5.

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (JP 2-84653 and its English abstract, Chemical Abstract AN 1990:506458) in view of Kunita et al (5,703,140).

The Japanese document has been submitted for English translation. Only the English abstract is available at this time.

Tanaka teaches a photosensitive composition comprising methyl methacrylate/methacrylic acid/2-ethylhexyl acrylate copolymer (present component (A)), methyl Cellosolve, tetraethylene glycol diacrylate (present component (B)), benzophenone (present component (C)), and p-toluenesulfonamide (present component (E)). See Chemical Abstract. In the table shown on pg.749 of the Japanese document, according to PTO's on-site English translation, it is indicated that Example 3 uses 3.0 grams of p-toluene sulfonamide. This converts to 1.498wt% of p-toluene sulfonamide. Therefore, the prior art teaches present component (E) in the amount of 3.5wt% or less as claimed in claim 1, in the range of 0.5-2.0wt% as claimed in claim 2, and also in the range of 1.0-1.5 wt% as claimed in claim 3.

Although the Chemical Abstract does not explicitly mention presently claimed thermal polymerization inhibitor, it is well known in the art that addition of a slight amount of a thermal

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polymerization inhibitor into a photopolymerizable composition prevents unnecessary thermal polymerization of the polymerizable ethylenically unsaturated compound during the production or storage of the photosensitive composition. For example, see Kunita et al, col.86, lines 61-67, col.87, lines 1-8 which teaches the addition of the thermal polymerization inhibitor into a photopolymerizable composition in the amount of 0.01-5wt% based on the weight of the entire composition. Therefore, it would have been obvious to one of ordinary skill in the art to add a slight amount of the thermal polymerization inhibitor into Tanaka's photosensitive composition in Example 3 in order to prevent unnecessary thermal polymerization of the polymerizable ethylenically unsaturated compound during the production or storage of the photosensitive composition as taught by Kunita. Therefore, Tanaka in view of Kunita would render obvious present inventions of claims 1-4.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (JP 2-84653 and its English abstract, Chemical Abstract AN 1990:506458) in view of Kunita et al (5,703,140) as applied to claim 1 above, and further in view of Ichikawa et al (5,744,282).

Tanaka and Kunita with respect to present claim 1 is discussed above in Paragraph 6. Tanaka uses in his Example 3, methyl methacrylate/methacrylic acid/2-ethylhexyl acrylate copolymer as his film forming polymer. Ichikawa, which also teaches a photosensitive composition comprising a polymeric binder, a polymerizable ethylenically unsaturated compound, a photoinitiator, and p-toluene sulfonamide, teaches (see col.4, lines 8-17) the equivalence of Tanaka's copolymer and homopolymer of methacrylic acid. Since the homopolymer of

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methacrylic acid and methyl methacrylate/methacrylic acid/2-ethylhexyl acrylate copolymer were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to replace methyl methacrylate/methacrylic acid/2-ethylhexyl acrylate copolymer with the homopolymer of methacrylic acid (which is water-soluble) in Tanaka's Example 3. Therefore, Tanaka, Kunita, and Ichikawa would render obvious the present invention of claim 5.

8. Claims 1, 2, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al (5,744,282) in view of Kunita et al (5,703,140).

In Examples 1-4 (see Table 1-3), Ichikawa teaches photosensitive resin composition comprising (I) methacrylic acid/methyl methacrylate/ethyl acrylate/ethyl methacrylate copolymer (*present component (A)*), (ii) diethylthioxanthone, ethyl dimethylaminobenzoate, and N,N'-tetraethyl-4,4'-diaminobenzophenone (*present component (C)*), (iii) UA-21 which is their component (B) a photopolymerizable compound having at least one polymerizable ethylenically unsaturated group in the molecule (*present component (B)*), and 1.79wt% of p-toluenesulfonamide (*present component (E)*).

Although Ichikawa does not teach present component (D), it is well known in the art that addition of a slight amount of a thermal polymerization inhibitor into a photopolymerizable composition prevents unnecessary thermal polymerization of the polymerizable ethylenically unsaturated compound during the production or storage of the photosensitive composition. For example, see Kunita et al, col.86, lines 61-67, col.87, lines 1-8 which teaches the addition of the

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thermal polymerization inhibitor into a photopolymerizable composition in the amount of 0.01-5wt% based on the weight of the entire composition. Therefore, it would have been obvious to one of ordinary skill in the art to add 0.01-5wt% of the thermal polymerization inhibitor into Ichikawa's photosensitive resin composition in Examples 1-4 in order to prevent unnecessary thermal polymerization of the polymerizable ethylenically unsaturated compound during the production or storage of the photosensitive composition as taught by Kunita. Therefore, Ichikawa in view of Kunita would render obvious present inventions of claims 1, 2, and 4.

With respect to present claim 5, although Ichikawa's Examples 1-4 uses methacrylic acid/methyl methacrylate/ethyl acrylate/ethyl methacrylate copolymer as the polymeric binder, Ichikawa teaches (col.4, lines 8-22) the equivalence of this copolymer to the homopolymer of methacrylic acid. Since the copolymer and homopolymer of methacrylic acid were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to replace the copolymer of Ichikawa's Example 1-4 with the homopolymer of methacrylic acid (which is a water soluble polymer). Therefore, Ichikawa in view of Kunita would render obvious present invention of claim 5.

9. Claims 1, 4, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Pine (4,361,640).

In Example 2, Sample A, Pine teaches (col.1, lines 58-68, col.2, lines 1-19) (I) a binder system (*present component (A)*) which is the reaction product of terpolymer of methylmethacrylate/n-butylacrylate/methacrylic acid, amine-terminated polyamide, and poly[vinyl

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pyrrolidone/vinyl acetate], (ii) an ethylenically unsaturated monomeric compound (*present component (B)*) which is tetraethyleneglycol diacrylate, (iii) free radical generating, addition polymerization initiators (*present component (C)*) which are 2,2-dimethoxy-2-phenyl acetophenone and 2-ethylanthraquinone, and (iv) a thermal polymerization inhibitor (*present component (D)*) which is 1,4,4-trimethyl-2,5-diazobicyclo-[3,2,2]-non-2-ene-N,N'-dioxide.

The composition of Sample A in Example 2 does not contain any ortho or para-toluene sulfonamide. Since present claim language does not require the presence of ortho or para-toluene sulfonamide (see Paragraph 3 above), Pine's composition in Sample A of Example 2 anticipates present invention of claim 1.

With respect to present claim 4, Pine also teaches present invention of claim 4 because present claim 4 which depends from claim 1 still does not require the presence of ortho or para-toluene sulfonamide (it merely claims that *if* there is to be ortho or para-toluene sulfonamide in the composition, then it should be para-toluene sulfonamide rather than the ortho compound).

With respect to present claim 5, since Pine's photopolymerizable composition is aqueous developable, it is the Examiner's position that Pine's binder system is impliedly water-soluble. Therefore, Pine teaches present invention of claim 5.

10. It is to be noted that present claims 2 and 3 are not rejected over Pine'640 under 35 U.S.C. 103(a) because it is the Examiner's position that applicants demonstrated the unexpected superior results of using p-toluenesulfonamide in the range of 0.5-2.0wt % (although it is the

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Examiner's position that applicants did not show unexpected superior results as to the rest of the claimed range).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is (703) 305-0504. The examiner can normally be reached on Monday-Friday from 8:30 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Janet Baxter, can be reached on (703) 308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9311 for after final responses or (703) 872-9310 for before final responses.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0661.

S. J. Lee

S. Lee
December 3, 2001



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